

# NASA TECH BRIEF

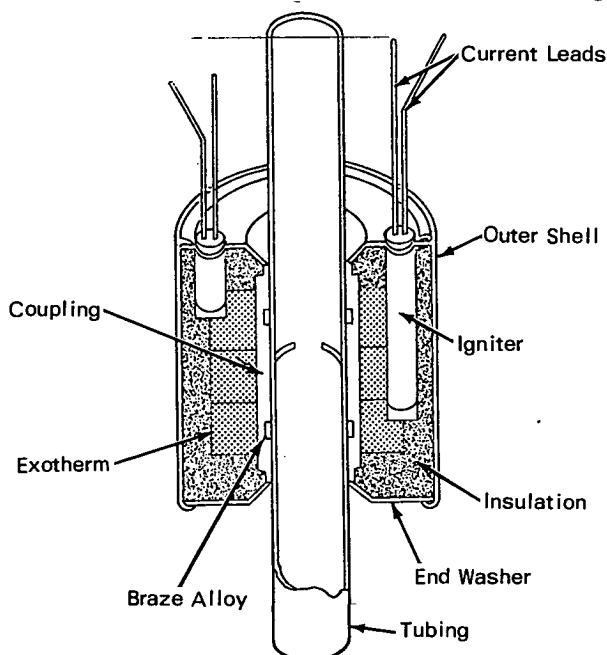
## Marshall Space Flight Center



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### Exothermic Brazing Units

Lightweight, compact, easy-to-handle exothermic brazing units can be used for repairing and assembling stainless steel tubing. In exothermic brazing



processes, the heat required to melt or flow the filler brazing metal is generated by a chemical reaction between one or more active metals and reducible metal oxides. The new process differs from other brazing methods in the source of heat. Only the heat generated by the chemical reaction is used to melt the brazing alloy, and the bonded area is not contaminated in any way by the reactants (exothermic mixture) or the by-products of the reaction.

Exothermic mixtures (exotherms) are ignited into a self-sustaining reaction by the passage of current from a low voltage battery through fine tung-

sten wires in igniters (see fig.), heating the wires to the ignition temperature of the exotherm which surrounds but does not contact the brazing alloy. The rate of heating and the total usable heat produced per unit mass of exotherm can be determined and controlled over a wide range. Control is established by appropriate chemical formulation and by the proper match between the exotherm unit configuration and the heat sink characteristics of the metal to be brazed. Exotherm compositions can be varied to control such properties as specific heat, thermal conductivity, emissivity of the mix, reaction product characteristics, and thermal pulse shape.

#### Note:

Requests for further information may be directed to:

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#### Patent status:

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